Pending claims:

1-22. Cancelled

23. (Currently amended) A transgenic non-human animal having a transgene integrated into the genome of the non-human animal and also having a *tet* operator-linked gene in the genome of the non-human animal, wherein:

the transgene comprises a transcriptional regulatory element functional in cells of the non-human animal operatively linked to a polynucleotide sequence encoding a fusion protein which activates transcription of said *tet* operator linked gene,

the fusion protein comprises a first polypeptide which is a Tet repressor operatively linked to a second polypeptide which directly or indirectly activates transcription in eukaryotic cells,

said *tet* operator-linked gene <u>is expressed at detectable levels</u> confers a detectable and functional phenotype on the non-human animal when expressed in cells of the <u>non-human animal</u>,

said transgene is expressed in cells of the non-human animal at a level sufficient to produce amounts of said fusion protein that are sufficient to activate transcription of the *tet* operator-linked gene; and

in the absence of tetracycline or a tetracycline analogue in the non-human animal, said fusion protein binds to the *tet* operator-linked gene and activates transcription of the *tet* operator linked gene such that the *tet* operator-linked gene is expressed at a <u>detectable</u> level <u>in sufficient to confer the detectable and functional phenotype on</u> the non-human <u>animal</u>, wherein the level of expression of the *tet* operator-linked gene can be downmodulated by administering tetracycline or a tetracycline analogue to the non-human animal.

24. **(Currently amended)** A transgenic non-human animal having a transgene integrated into the genome of the non-human animal, wherein:

the transgene comprises a transcriptional regulatory element functional in cells of the non-human animal operatively linked to a polynucleotide sequence encoding a fusion protein which activates transcription of a *tet* operator linked gene <u>at a detectable level</u>,

the fusion protein comprising a first polypeptide which is a Tet repressor, operatively linked to a second polypeptide which directly or indirectly activates transcription in eukaryotic cells, and

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- 25. **(Previously presented)** The non-human animal of claim 23, wherein the second polypeptide of the fusion protein comprises a transcription activation domain of herpes simplex virion protein 16.
- 26. **(Previously presented)** The non-human animal of claim 24, wherein the second polypeptide of the fusion protein comprises a transcription activation domain of herpes simplex virion protein 16.

27-30. Cancelled

- 31. **(Previously presented)** The non-human animal of claim 23, wherein the *tet* operator-linked gene is a second transgene comprising a gene of interest operably linked to at least one *tet* operator sequence.
- 32. **(Previously presented)** The non-human animal of claim 24, wherein the *tet* operator-linked gene is an endogenous gene that has been operatively linked to at least one *tet* operator sequence.
- 33. **(Previously presented)** The non-human animal of claim 23, which is selected from the group consisting of: a mouse, a cow, a sheep, a goat, and a pig.
- 34. **(Previously presented)** The non-human animal of claim 24, which is selected from the group consisting of: a mouse, a cow, a sheep, a goat, and a pig.
- 35. (Currently amended) A transgenic non-human animal selected from the group consisting of a mouse, a cow, a sheep, a goat, and a pig, having a transgene integrated into the genome of the non-human animal and also having a *tet* operator-linked gene in the genome of the non-human animal, wherein:

the transgene comprises a transcriptional regulatory element functional in cells of the non-human animal operatively linked to a polynucleotide sequence encoding a fusion protein which activates transcription of said *tet* operator linked gene, the fusion protein comprises a first polypeptide which Tet repressor operatively linked to a second polypeptide which directly or indirectly activates transcription in eukaryotic cells,

said *tet* operator-linked gene <u>is expressed</u> at <u>detectable levels</u> confers a detectable and functional phenotype on the organism when expressed in cells of the non-human animal,

said transgene is expressed in cells of the non-human animal at a level sufficient to produce amounts of said fusion protein that are sufficient to activate transcription of the *tet* operator-linked gene; and

in the absence of tetracycline or a tetracycline analogue in the non-human animal, said fusion protein binds to the *tet* operator-linked gene and activates transcription of the *tet* operator linked gene such that the *tet* operator-linked gene is expressed at a <u>detectable</u> level <u>in sufficient to confer the detectable and functional phenotype on</u> the non-human animal, wherein the level of expression of the *tet* operator-linked gene can be downmodulated by administering tetracycline or a tetracycline analogue to the non-human animal.

36. (Currently amended) A transgenic non-human animal selected from the group consisting of a mouse, a cow, a sheep, a goat, and a pig having a transgene integrated into the genome of the non-human animal, wherein:

the transgene comprises a transcriptional regulatory element functional in cells of the non-human animal operatively linked to a polynucleotide sequence encoding a fusion protein which activates transcription of a *tet* operator linked gene <u>at a detectable level</u>,

the fusion protein comprising a first polypeptide which is a Tet repressor, operatively linked to a second polypeptide which directly or indirectly activates transcription in eukaryotic cells, and

said transgene fusion protein is expressed in cells of the non-human animal.

- 37. (Previously presented) The non-human animal of claim 35, wherein the second polypeptide of the fusion protein comprises a transcription activation domain of herpes simplex virion protein 16.
- 38. (Previously presented) The non-human animal of claim 36, wherein the second polypeptide of the fusion protein comprises a transcription activation domain of herpes simplex virion protein 16.

- 39. **(Previously presented)** The non-human animal of claim 35, wherein the *tet* operator-linked gene is a second transgene comprising a gene of interest operably linked to at least one *tet* operator sequence.
- 40. **(Previously presented)** The non-human animal of claim 36, wherein the *tet* operator-linked gene is an endogenous gene that has been operatively linked to at least one *tet* operator sequence.